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Docket No.: 331.1050
Date: September 27, 2006

AF
JRW

In re application of: **Torsten GERLICH, et al.**

Serial No.: 10/665,137

Filed: September 18, 2003

For: **CIRCUITRY CONFIGURATION FOR AN ELECTROMAGNETIC REGENERATION VALVE
ACTUATABLE BY PULSE-WIDTH MODULATION FOR VENTING THE TANK OF A MOTOR
VEHICLE**

Sir:

Transmitted herewith is a **Appellants' Brief under 37 C.F.R. §41.37 with Appendices A to C (10 pages)** in the above-identified patent application.

- ☐ Small entity status under 37 C.F.R. 1.9 and 1.27 has been previously established.
- ☐ Applicants assert small entity status under 37 C.F.R. 1.9 and 1.27.
- ☒ No fee for additional claims is required.
- ☐ A filing fee for additional claims calculated as shown below, is required:

- ☐ Also transmitted herewith are:
 - ☐ Petition for extension under 37 C.F.R. 1.136 (in duplicate)
 - ☐ Other:

- ☐ Check(s) in the amount of **\$0.00** is/are attached to cover:
 - ☐ Filing fee for additional claims under 37 C.F.R. 1.16
 - ☐ Petition fee for extension under 37 C.F.R. 1.136
 - ☐ Other:

- ☒ The Assistant Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 50-0552.

- ☒ Any filing fee under 37 C.F.R. 1.16 for the presentation of additional claims which are not paid by check submitted herewith.
- ☒ Any patent application processing fees under 37 C.F.R. 1.17.
- ☒ Any petition fees for extension under 37 C.F.R. 1.136 which are not paid by check submitted herewith, and it is hereby requested that this be a petition for an automatic extension of time under 37 CFR 1.136.

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I hereby certify that this correspondence and/or documents referred to as attached therein and/or fee are being deposited with the United States Postal Service as "first class mail" in an envelope addressed to "Mail Stop: APPEAL BRIEF - PATENTS, Commissioner for Patents, Alexandria, VA 22313" on September 27, 2006.

DAVIDSON, DAVIDSON & KAPPEL, LLC

BY: Oliver Platz



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Re.: Serial No.: 10/665,137 Confirmation No.: 5808
Applicant: Torsten GERLICH, et al.
Filed: September 18, 2003
Art Unit: 2836
Examiner: Zeev KITOV
Attorney Docket No.: 331.1050
Customer No.: 23280

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

September 27, 2006

APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37

Sir:

Appellants submit this second appeal brief for the consideration of the Board of Patent Appeals and Interferences (the "Board") in support of their appeal of the Final Rejection dated May 4, 2006 in this application. The statutory fee of \$500.00 has been previously paid with the appeal brief dated February 15, 2006 and should be applied to this new appeal brief.

Attached hereto is Appendix A, an appendix of claims involved in the appeal as required by 37 C.F.R. §41.37; Appendix B, an evidence appendix according to 37 C.F.R. §41.37(c)(ix); and Appendix C, a related proceedings appendix according to 37 C.F.R. §41.37(c)(x).

1. REAL PARTY IN INTEREST

The real parties in interest are Carl Freudenberg KG, a German Corporation having their place of business at Hoehnerweg 2-4, Weinheim, Germany, the assignees of the entire right, title and interest in the above-identified patent application. The invention was assigned by inventors Torsten GERLICH, Christopher KLATT, Ralf HEINRICH and Christoph KLESEN to Carl Freudenberg KG. The assignment was recorded on January 8, 2004 at reel 014861, frame 0865.

2. RELATED APPEALS AND INTERFERENCES

Appellants, their legal representatives, and assignee are not aware of any appeal or interference that directly affects, will be directly affected by, or will have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

Claims 1 to 8 are pending. Claims 1 to 8 have been finally rejected as per the Final Office Action dated May 4, 2006.

The rejection to claims 1 to 8 thus is appealed. A copy of appealed claims 1 to 8 is attached hereto as Appendix A.

4. STATUS OF AMENDMENTS AFTER FINAL

A notice of appeal was filed on July 25, 2006 after the final rejection but no claims were amended.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention provides for an electromagnetic regeneration valve (Fig. 1) for venting a tank of a motor vehicle, the regeneration valve being actuatable by pulse-width modulation and having a pulsed mode and a proportional mode having a higher frequency than the pulsed mode comprising: a solenoid (represented by R_{sp} and L_{sp} Fig. 1, see [0017] of the specification), and circuitry configuration including: i) a power source (see U_b of Fig. 1, see specification at [0017] for example) for supplying the solenoid with electricity; ii) a control unit for generating pulse-width-modulated signals (see U_s of Fig. 1 for example); iii) a switching device (see power transistor in [0017] for example), the solenoid capable of receiving the pulse-width-modulated signals of the control unit via the switching device; and iv) a suppression device (see

for example D_f in Fig. 1 and [0017]) suppressing high induced voltages at the solenoid, the solenoid in the proportional mode having a position corresponding to a mean current level (See: e.g., page 1, paragraph [0002], page 2, paragraph [0005] and [0008]).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1 to 3, 7 and 8 should be rejected under 35 U.S.C. § 103 (a) as being unpatentable over Busato (WO 99/06893) in view of Maller (US 6,256,185).

Whether claims 5 and 6 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Maller and Klotz (US 4,915,204).

Whether claim 4 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Maller and Stumpf (US 4,851,959).

7. ARGUMENTS

Rejections under 35 U.S.C. §103

A. Claims 1 to 3, 7 and 8

Claims 1 to 3, 7 and 8 were rejected under 35 U.S.C. § 103 as unpatentable over Busato in view of by Maller.

Busato is discussed in the present specification at [0003].

Maller discloses solenoid circuitry in which the module “provides a continuous voltage to a solenoid for purposes of performing work, and a pulse width modulated voltage to maintain the solenoid in a hold position.” Col. 4, lines 22 to 25.

Independent claim 1 of the present invention recites:

An electromagnetic regeneration valve for venting a tank of a motor vehicle, the regeneration valve being actuatable by pulse-width modulation and having a pulsed mode and a proportional mode having a higher frequency than the pulsed mode comprising:

- a solenoid, and circuitry configuration including:
- a power source for supplying the solenoid with electricity;
- a control unit for generating pulse-width-modulated signals;
- a switching device, the solenoid capable of receiving the pulse-width-modulated signals of the control unit via the switching device; and

a suppression device for suppressing high induced voltages at the solenoid, the solenoid in the proportional mode having a position corresponding to a mean current level.

In solenoid controls such as in Busato, where both high and low frequency signals are used for two modes of control (See Busato at page 6, line 15 et seq.), voltage suppression devices have generally been regarded as not desired as they have been thought of to interfere with the fine response required. See [0010] of the present specification: “The use of free-wheel diodes is a known process in valve engineering and generally serves the purpose of protecting the power circuit breakers which control the current against the high induced voltages which occur as the valve reverses. It is also known that this measure results in *undesirable lengthening of the coil reaction time.*”

As stated by the present specification at [0011], it has surprisingly been found that the use of the free-wheeling diodes in proportional and pulsed mode control devices actually *reduces noise* for the control signals while still permitting adequate response times.

The Examiner has now changed the position as to what is “a suppression device.” Maller discloses a transient protection device Z3 and a Schottky diode D3, and these previously were considered the suppression device together by the Examiner.

The Examiner now states that this was a “typo” and that only the Schottky diode is the suppression device. However, Maller makes clear that the Schottky diode is for improved magnetic drive or reduced power dissipation in the diode itself, and is not a suppression device in the Maller device. See col. 7, lines 51 to 58 of Maller. (Applicant had not contested that Z3 in conjunction with D3 might be considered a transient voltage protection device, as Z3 specifically is) See col. 7, lines 35 to 45)

Moreover, Z3 in conjunction with D3 is a standard protection device discussed in the present invention and are not for a highly-controlled pulsed and proportional mode control circuit. Maller provides a continuous voltage during solenoid work and seeks to suppress surges during this.

Generally, the highly controlled Busato device has not been seen as needing suppression devices as the voltage is controlled via pulse modulation, and also it was

thought that suppression devices would impact the response times. Nothing in Maller teaches the use of D3 alone as a suppression device, and nothing in such a dual pulsed mode device as disclosed by Busato.

Withdrawal of the rejection to claim 1 and its dependent claims is respectfully requested.

Claim 8: Argued separately

Claim 8 recites the “electromagnetic regeneration valve as recited in claim 7, further comprising a further diode connected in parallel to the power transistor.” Claim 7 depends from claim 1, and recites that “the switching device includes a power transistor.”

The Office Action asserts that Z3 of Maller is the further diode, but this is an element (which previously was asserted is part of the suppression device). Moreover, there is no motivation or teaching given to provide the Z3 device in parallel with the asserted transistor *of Busato*.

Withdrawal of the rejection to claim 8 for this reason as well is respectfully requested.

B. Rejections under 35 U.S.C. §103

1. Claim 4

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Maller and Stumpf (US 4,851,959).

In view of the comments with respect to claim 1, withdrawal of the rejection is respectfully requested. In addition, it further respectfully submitted that the 50Hz recited in claim 4 has been found particularly useful in the dual mode circuitry of the present invention, and Stumpf would not have made this selected frequency obvious.

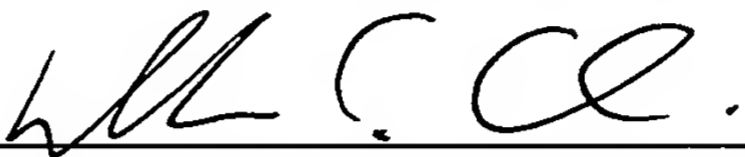
2. Claims 5 and 6

Claims 5 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Maller and Klotz (US 4,915,204).

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In view of the comments with respect to claim 1, withdrawal of the rejection is respectfully requested.

Respectfully submitted,
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APPENDIX A

PENDING CLAIMS 1 TO 8 OF U.S. APPLICATION SERIAL NO. 10/665,137

- Claim 1. (previously presented) An electromagnetic regeneration valve for venting a tank of a motor vehicle, the regeneration valve being actuatable by pulse-width modulation and having a pulsed mode and a proportional mode having a higher frequency than the pulsed mode comprising:
- a solenoid, and circuitry configuration including:
 - a power source for supplying the solenoid with electricity;
 - a control unit for generating pulse-width-modulated signals;
 - a switching device, the solenoid capable of receiving the pulse-width-modulated signals of the control unit via the switching device; and
 - a suppression device for suppressing high induced voltages at the solenoid, the solenoid in the proportional mode having a position corresponding to a mean current level.
- Claim 2. (previously presented) The electromagnetic regeneration valve as recited in claim 1, wherein the suppression device includes a free-wheeling diode connected in parallel to the solenoid.
- Claim 3. (previously presented) The electromagnetic regeneration valve as recited in claim 1, wherein the regeneration valve is actuatable in the proportional mode with a pulse frequency of between 20 Hz and 200 Hz.
- Claim 4. (previously presented) The electromagnetic regeneration valve as recited in claim 3, wherein the regeneration valve is actuatable with a pulse frequency of about 50 Hz.
- Claim 5. (previously presented) The electromagnetic regeneration valve as recited in claim 1, wherein the power source includes the vehicle's electrical system.
- Claim 6. (previously presented) The electromagnetic regeneration valve as recited in claim 1, wherein the control unit includes an engine controller.

Claim 7. (previously presented) The electromagnetic regeneration valve as recited in claim 1, wherein the switching device includes a power transistor.

Claim 8. (previously presented) The electromagnetic regeneration valve as recited in claim 7, further comprising a further diode connected in parallel to the power transistor.

APPENDIX B

Evidence Appendix under 37 C.F.R. §41.37 (c) (ix):

No evidence pursuant to §§1.130, 1.131 or 1.132 and relied upon in the appeal has been submitted by appellants or entered by the examiner.

APPENDIX C

Related proceedings appendix under 37 C.F.R. §41.37 (c) (x):

As stated in “2. RELATED APPEALS AND INTERFERENCES” of this appeal brief, appellants, their legal representatives, and assignee are not aware of any appeal or interference that directly affects, will be directly affected by, or will have a bearing on the Board's decision in this appeal.